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THE ACHEMON SPHINX—*Philampelus achemon* Drury.

BY THE EDITOR.

The Achemon Sphinx is not common in Ontario; occasionally, but rarely, we have found the larva both on the Grape-vine and Virginia Creeper (*Ampelopsis quinquefolia*), and once or twice captured the perfect insect.



Fig. 4.

The moth (fig. 4) is a handsome one, and having the usual strong and rapid flight of the Sphinges, is not easily captured. It may be met with on the wing late in June, about dusk, hovering like a humming-bird over flowers and sipping their sweets through its long proboscis. Its color is brownish-gray, variegated with light brown, and with the dark spots

shown in the figure of a deep brown. The hind wings are pink with a dark shade across the middle, a few still darker spots below, and with the hind margin widely bordered with gray.

The caterpillar (fig. 5) is a formidable looking creature, measuring when full grown, if at rest, about three inches, but when in motion three



a

Fig. 5.

and a half inches. They feed singly, and hence, when young, do not attract much notice, but as they mature they consume enormous quantities of food, so that a single specimen will in a short time render long branches of the vine entirely leafless. This larva varies much in color; when young it is usually green, with a long, slender, reddish horn rising from the last segment but one, and curving backward, but after each moult this horn gradually lessens in size until, as it approaches maturity, it disappears entirely, its place being occupied by a polished tubercle. When full grown the general color is sometimes green, but more frequently a pale straw or reddish-brown, deepening in color at the sides, and finally merging into a rich brown; there is also a broken line of brown along the back, and another unbroken, with its upper edge fading gradually along each side. It has six scalloped, cream-colored spots on each side, and the body is covered more or less with minute spots, which are dark on the back, but light and annulated at the sides. There are also from six to eight transverse wrinkles on all but the thoracic and caudal segments. The head, anterior segments and spiracles incline to flesh color, the pro-legs and caudal plate deep brown. The largest segment in the body of the larva is the third behind the head, and into this, when at rest, is usually withdrawn the head and two anterior segments—as shown in the figure.

When full grown and about to transform to a chrysalis, the color of the caterpillar often changes to that of a beautiful pink or crimson. It then descends to the ground and burrows underneath, and there undergoes its transformation to the pupa state within a smooth cavity.

The chrysalis (fig. 6) is of a dark shining mahogany color, roughened especially on the anterior edge of the segments in the back. It remains



Fig. 6.

in the ground through the fall, winter and spring months, producing the moth the following summer.

VARIATIONS IN THE WING EXPANSE OF PEZOTETTIX.

BY G. M. DODGE, GLENCOE, NEBRASKA.

In the CAN. ENT., vol. ix., p. 112, I have described as a new species, under the name of *Caloptenus volucris*, a long-winged variety of *Pezotettix autumnalis* Dodge. I separated it because of its great length of wing, in which respect it equals many specimens of *Cal. spretus*, while in the typical *autumnalis* the elytra are very short, ovate and pointed. It also exhibited some variations in color. The latter I have since seen paralleled in *autumnalis*, and having found long-winged varieties of two other species of *Pezotettix*, I am now fully satisfied of the varietal character of *volucris*.

All the authorities agree in making the lack of wings, or the abbreviated character of those organs, the principal reason for separating the genus *Pezotettix* from *Caloptenus*. My experience shows, however, that the length of wing in these insects cannot be relied upon as a specific distinction even. It is plain that these long-winged varieties by in-breeding might establish a local variety of what would appear to be *Caloptenus*, but which would in reality be *Pezotettix*. It is possible, then, that all our species of *Caloptenus* were originally *Pezotettix*; that, by acquiring additional means of locomotion, were enabled to survive their ignoble relatives. This would certainly accord with the natural law of the "survival of the fittest."

One of my species, *Pezotettix alba* Dodge, seems to exhibit a transition from something still lower. I have an example in which the elytra are barely one-tenth of an inch in length, only half as long as in the typical or common form. In this specimen the cerci are much smaller than usual, although the insect is of the common size.

I do not yet know whether these variations in wing expanse are common to both sexes or not. I have so far found them only in male specimens, but that is no proof that winged females do not also occur.

Lest any should imagine that I am wrong in determining these long-winged specimens to be varieties rather than species, I will say that these species of *Pezotettix* are not liable to be confounded with any *Caloptenus* and that the varieties do not, with the exceptions already mentioned, differ in form or color from the types.

Pezotettix alba is particularly distinct, being white or greenish-white in color, and occurring only upon a native plant whose stems and foliage are also white. This plant, commonly, but incorrectly, called wild sage, grows in clumps many rods apart upon the prairie; but the insect is never found upon the intervening grass. The winged variety was also found upon the same plant.

The following shows the comparative length of wing in these varieties:—

<i>Pez. alba</i> Dodge.		<i>Pez. junius</i> Dodge.	
Variety, ♂—Length of elytra,		Type, ♂—Length of elytra, .40 to	
.10 inch.		.45 inch.	
Type, ♂—Length of elytra,		Type, ♀—Length of elytra, .45 to	
.175 inch.		.50 inch.	
Type, ♀—Length of elytra,		Variety, ♂—Length of elytra, .70	
.20 inch.		inch.	
Variety—Length of elytra, .50			
or .60 inch.			

Pez. autumnalis Dodge.

Type, ♂—Length of elytra, .20 to .23 inch.	
“ ♀ “ “ .26 inch.	
Variety “ “ .70 “	

The Caloptenoids are not more constant in color than other genera of Acrididæ, red-legged ones producing blue-legged varieties, and vice-

versa. Worthy of special mention are two males and a female, of the red-legged *C. spretus*, with hind tibiae pale blue. As I found them all in one locality, they were probably produced from one batch of eggs. *C. minor* Scudd. has a red-legged variety here. Have taken many specimens, but all were females.

DESCRIPTION OF THE PREPARATORY STAGES OF NEONYMPHA EURYTRIS.

BY W. H. EDWARDS, COALBURGH, W. VA.

EGG—Sub-globose, well rounded in every part, but somewhat broadest below the middle; wholly covered by fine, irregularly hexagonal reticulations, scarcely raised above the surface; color yellow-green. Duration of this stage 8 days.

YOUNG LARVA—Length .08 inch; cylindrical, thickest in middle, tapering pretty evenly either way, the last segment ending in two short tails; body covered with fine white hairs, slightly recurved; color pink-white, marked longitudinally by seven crimson lines, one of which is medio-dorsal, and three on either side; head sub-globose, nearly twice as broad as any body segment, flattened frontally, depressed slightly at top, and with a small conical process upon each vertex; color dark brown. To next stage 7 days.

AFTER FIRST MOULT—Length .16 inch. Body flat at base, rounded dorsally, and arched in middle segments, the sides sloping; the tails short, conical; color drab, either of a green or red tint, individuals varying; striped longitudinally with dull red, there being a narrow medio-dorsal stripe of this color, and two others on middle of each side; the whole surface finely but roughly tuberculated, the tubercles being irregular in size and length, sharp, and each emitting a short hair; colored also according to the ground they occupy; head sub-pyriform, flattened frontally, truncated at summit, and on each vertex a small rounded red process; color of head yellowish, finely mottled with red. Duration of this stage 6 days.

AFTER SECOND MOULT—Length .24 inch. Shape as at last stage ; a fleshy ridge over the feet ; color dull ochrey-yellow, striped with brown ; the dorsal stripe broad and dark, and a similar one on the lower part of the side ; two narrow stripes on the middle of each side, paler colored ; the tails reddish at tips ; surface of body as before ; head shaped as before, yellow, the upper front crossed by two arched rows of rounded brown patches. To next moult 14 days.

AFTER THIRD MOULT—Length .44 inch. The middle segments stouter, the base broader, than before ; color pale ochre-yellow somewhat mottled with reddish on dorsum, but variable in this respect ; the lateral stripes sometimes nearly or quite obsolete, and in place of the upper one is a dark point or spot at the extreme hinder part of each segment from 4 to 10 ; behind this the side is mottled with a darker shade than the ground ; the basal ridge buff ; surface more roughened than before ; head nearly as before, the spots on the face darker, and a third row appears faintly below the others. To next moult 30 days.

AFTER FOURTH AND LAST MOULT—To maturity—days.

MATURE LARVA—Length 1 inch. Body flat at base, the dorsum rounded, much arched on middle segments, the sides flat and sloping ; over the feet a fleshy ridge ; the second segment constricted much as in *Hesperia* ; the last segment bifurcate, each fork short, pointed, divergent ; color of dorsum yellow-brown ; of sides, darker ; a medio-dorsal band dark brown, and on either side of this on each segment from 4 to 11 is an indistinct dark patch ; the lateral area separated from the dorsal by two wavy parallel lines, the upper one dark, the other yellowish ; on the side of each segment from 5 to 11 is a dark oblique stripe ; the basal ridge yellowish ; the tails tipped with red ; the whole surface covered with sharp tubercles of irregular sizes and colored as the ground, each emitting a short brown hair ; feet and legs yellow-brown ; head sub-pyriform, flattened in front, truncated at summit and slightly depressed ; the vertices a little produced, pointed and compressed ; color yellow-brown, finely tuberculated ; the face crossed by three rows of rounded brown patches.

CHRYSALIS—Length .5 inch. Same shape as *sosybius* ; cylindrical, the abdomen stout and larger than the anterior portion ; mesonotum rounded, arched ; the head case truncated abruptly from the base of the mesonotum, narrow ; wing cases somewhat flaring at base ; the neuration of the wings seen distinctly ; color pale yellow-brown, the wing cases and

anterior parts streaked with fine, abbreviated, brown lines ; on the margins of the wing cases a series of dark brown spots ; beneath the abdomen two brown stripes, and on the middle of each side a row of brown points extending from the mesonotum to extremity. Duration of this stage 11 days.

Eurytris is a common species in this section of West Virginia, found in the borders of the forest and in the adjacent fields, especially if these last are more or less overgrown with brambles, &c. The eggs are easily obtained by confining the female in a box, or over a flower pot in which a bit of sod has been placed. They are laid upon the grass, or dropped loosely upon the sod or the earth. The first eggs so obtained by me were laid 30th May. The earlier stages were rapidly passed, as related above, but the last were very much prolonged. About 20th July, soon after the third moult, the larvæ all ceased feeding, and some appeared to be in profound lethargy. But others, after resting for several days, would arouse and eat a little, then sleep again. But every one, notwithstanding the lethargic condition, was found to have changed its position several times. After keeping them so two weeks, I left home for some months, and on my return found all were dead. But one larva that I had sent to Miss Peart before 20th July went on to imago, and I inferred that probably some of the others would have done so after sleeping for an interval, had I been at hand to feed them. This was in 1876. In 1877 I raised a small brood from eggs obtained 31st May. With these every stage of the larvæ, after the first, lingered. When about to moult the larva remained for three or four days before this event motionless, and as many after, and there were periods of several days between the moults when they rested and took no food. As I kept them in small glasses it was easy to determine this. The larva is sluggish at all times, moves very little and with great deliberation. Part of this brood at last ceased feeding altogether and contracted themselves for a long sleep. But I eventually lost all but one of these, probably from the heat of the weather, as one after another dropped off its support, dead. The single larva spoken of continued to feed and reached the length of about one inch, when winter set in, and I then set it in a cold room to preserve it till spring. By an accident this one was lost in January. It appeared to be healthy up to this time, and the imago would probably have emerged from chrysalis in early spring. It will be seen that breeding these larvæ is an excessively tedious matter, requiring months to perfect, and involving many risks. As fresh butterflies

of *Eurytris* are flying here in the fall, there are of course two broods, but breeding shows that some of the larvæ of the first brood became lethargic in summer, and so they pass the winter. The larvæ of the second brood doubtless pass the winter in their earlier stages, and begin again to feed early in the next season.

Mr. Scudder, Trans. Am. Ent. Soc., 1877, p. 74, has spoken of the marked resemblance between the imagos of the Satyridæ and Hesperidæ in many important features, and calls attention to the very great similarity between the chrysalids of the two families. I concur with him fully in these respects, but I would suggest that the resemblances between the larvæ and their behavior is often just as great. I am more and more satisfied from the study of the preparatory stages of the Satyrids, that their true place in classification is very near the Hesperidæ.

DESCRIPTION OF A NEW BRONCHELIA.

BY W. V. ANDREWS, BROOKLYN, N. Y.

Bronchelia gravilinearia, n. sp.

The general ground color of this species is a light brown, approaching a fawn color. The palpi, however, are of a dark brown.

F. w.—Wing stretch $1\frac{3}{4}$ in. There are five distinct, dark brown, transverse bands, all commencing on the costa. The first two basal, and rather close to each other; the inner of the two somewhat broken. The third very heavy. The fourth is much narrower than the third, and commences on the costa at about one-tenth of an inch from the third, curving until it touches it at about mid-wing, thence running nearly confluent with it to inner margin. The fifth band is not quite so heavy as the third, and is broken at about the third nervule. All the bands curve towards the base, but are not quite parallel. The space between the fifth band and outer margin is thickly covered with scales of the same dark brown as the bands. Outer margin slightly notched, with a row of dark brown lunar marks. All the bands, except one and two, are extended across the hind wings.

H. w.—The heavy third band of *f. w.* is equally heavy on *h. w.*, and is bisected at a right angle by a heavy brown line, forming a T mark. The slight fourth band commences on this wing at about the same distance from the third as it does on *f. w.*, and runs a zigzag course to inner margin. The fifth band is broken, as described on *f. w.* The outer margin of this wing is more deeply notched than the outer margin of *f. w.*, and the lunar marks are more distinct, and are larger. All the markings are of the same dark brown color.

In general appearance this species differs greatly from *hortaria*, the dark scales being much less diffused.

The under side of both wings is concolorous, or nearly so, with their upper side, with very few scattered brown scales. Of the *f. w.* under side all the bands of the upper side are distinct and clear except the first. Of the *h. w.*, the bands are much fainter, the third and fifth being the heavier, while the fourth is scarcely perceptible.

A single ♂ specimen from Indiana. Coll. W. V. A.

I hesitated for some time before venturing to describe this species, thinking it possible that it may be Gueneé's *B. dendraria*, but Packard's statement that the third and fourth lines of *dendraria* were broad, confused and blended, does not apply to the example before me.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

CORISCUM.

C. 5-strigella Cham.

By a slip of the pen the description of this species contains the following sentence: "Annulus about its middle at the tip." It should read: "Middle and another at its tip." There are several indistinct costal streaks besides the five larger ones from which it takes its name, and there are four brown spots or longitudinal dashes along the line where the general brownish-gray color of the wing meets the white dorsal part.

COLEOPHORA.

C. gigantella Cham.

A typographical error in the original description makes it read "*these* are in the apical part of the wing" for "*three* are in," etc. The species was described from a single specimen from Canada, and was placed in the section "having the palpi simple." Since then I have bred it from cases found in May attached to Maple trees (*Acer saccharinum*), in Kentucky. The specimen in Mr. Saunders' collection had probably been a little injured in setting, as in the bred specimens I find there is a minute tuft at the apex of the second joint of the palpi, and there is also an ochreous streak from the base along the dorsal margin of the fore wings.

Among the European species figured in the *Nat. Hist. Tin.*, *C. virgauræ* most nearly resembles this species, which, however, is larger than *virgauræ* and has no brown dusting on the wings. *Virgauræ*, likewise, has the costa narrowly white to the middle, whilst in *gigantella* the extreme costa is of the same pale brownish ochreous with the streaks on the wing. The streaks on the fore wings are in other respects alike in the two species. The hind wings, abdomen and anal tuft are gray (in *virgauræ* the tuft is yellowish ochreous). The ciliæ of the fore wings are a little paler and more grayish than the streaks on the wings, and the outer surface of the palpi is brownish ochreous. The larval case is of the same form in this species as in *virgauræ*, except that it is a little more slender, and it is of a sordid brownish-yellow color. The imago comes out in the latter half of June.

C. shaleriella Cham. resembles *gigantella* closely, but is a little larger, having an *al. ex.* of $\frac{7}{8}$ inch, while that of *gigantella* is five lines; and in *shaleriella* the antennæ are not annulate with brown.

Both of these species approach *C. cratipennella* Clem. Dr. Clemens gives no measurements, and I have not seen his species; but from his account of it, it would seem to differ from *gigantella* and *shaleriella* by the unusual width of the streak which extends along the wing between the costal and subcostal veins, and by "the stripe along the subcostal vein which sub-divides into two branches terminating on the costa," and in the number and course of the streaks in the apical part of the wing; the color of the basal portion of the costa is not stated by Dr. Clemens.

I have no specimen of *shaleriella* for comparison now, and it may prove to be identical with *gigantella*.

C. fagicorticella Cham.

This species does not closely resemble any of those figured in *Nat. Hist. Tin.*; the larval case, however, resembles that of *C. murinipennella* in form. The imago is perhaps more like *C. Gnaphalii* than any other there figured. The palpal tuft is very small and the *al. ex.* varies from something over $\frac{1}{3}$ to about $\frac{1}{4}$ inch. The wings are very indistinctly marked, and the yellowish tinge of the apical portion of the primaries is faint. There is a wide, pale yellowish-ochreous streak along the dorsal margin; indeed sometimes the entire dorsal part of the wing beneath the fold is of that color, and the furcate yellowish streak above the fold is so close to it that one sometimes may fail to observe that the fold itself is whitish. Very faint lines may also be observed along the course of the veins in the apical part of the wing, and their course in perfectly fresh specimens is made more distinct by lines of sparsely dusted brown scales which margin them; the streak along the costa is also very indistinct. Ciliæ of fore wings pale yellowish; hind wings and their ciliæ, and abdomen, gray; anal tuft white. Length of larval case $2\frac{1}{2}$ lines.

C. unicolorella Cham.

This species was described from captured specimens, and I have since bred it. The larval case does not closely resemble any of those figured in *Nat. Hist. Tin.* It is most like that of *virgaurea*, but is much shorter in proportion and smaller every way, with the anterior end curved downwards. It is grayish or ochreous, with little blackish specks adhering to it. Length $2\frac{1}{4}$ lines.

The imago is sometimes a little larger than the dimensions given ($\frac{1}{8}$ inch), reaching $\frac{3}{8}$ inch *al. ex.* It is proper to add that the hind wings and upper surface of the abdomen are slate color, the under surface of the abdomen yellowish, and the antennæ very faintly annulate with yellowish. Otherwise the entire insect is as I have described it, of a grayish drab color. Of the species figured in *Nat. Hist. Tin.*, it seems to come nearest *siccifolia*, having the hind wings wider than in the other unicolorous species there figured; but the fore wings are rather darker than in that species. The case is very common in May, adhering to the bark of forest trees, but the food plant is unknown.

C. linea-pulvella Cham.

Palpi tufted; antennæ with the basal and a few following joints a little enlarged. Head and appendages pale ochreous, the outer surface of the

palpi brownish, and the antennæ with alternate annulations of dark ochreous and white. Fore wings ochreous, with *white lines so densely dusted with dark brown or blackish scales as almost to conceal the white*; one of these extends along the costal margin; another from the base to the apex, giving off three branches to the costal margin, the first being emitted just before the middle; another extends along the fold, and there is a more indistinct one along the dorsal margin. Hind wings fuscous; abdomen dark lead color above, paler and more ochreous below. *Al. ex. 5* lines. Ky., June 21st (some specimens in Cambridge Museum are labeled by mistake *nigripulvella*). The basal joint of the antennæ is but little larger than those immediately following, but these are themselves a little enlarged.

C. argentella.

This is *C. argentialbella* Cham., CAN. ENT., v. 7, p. 75, and *Bul. Geo. Survey* (Hayden), v. 3, pt. 1, pp. 133 and 141—not *C. argentialbella* Cham., CAN. ENT., v. 6, p. 128. *Argentella* is heretofore known only from Texas and Colorado, but I have also since taken a single specimen in Kentucky. When it was first described I had no means of reference to my collection of Kentucky species, nor to my notes or published descriptions, and the previous use of the name *argentialbella* for the smaller Kentucky species escaped my recollection. *Argentialbella* is retained for the smaller, and first described species, known as yet only from Kentucky; *argentella* for the larger species.

C. bistrigella Cham.

There seems to be much difference in the intensity of the yellow streaks on the fore wings and the amount of brown dusting along the margins of the streaks. The single specimen taken in Colorado was somewhat worn, and all my specimens from Texas had been captured for a good while, and the colors may have faded somewhat. It may turn out, on the examination of fresh specimens, that it is identical with *C. basistrigella* Cham. from Colorado, which is only known by a single specimen, which, however, is in perfect condition. Neither has been found except in Texas and Colorado as yet.

C. caryaefoliella.

C. cretaticostella? Clem.

C. rufoluteella Cham.

Dr. Clemens gave names to several species which were known to him only by the food plant, larval case or larva. Among these he mentions a species feeding on Hickory leaves under the name of *caryaefoliella*. He also describes a captured imago under the name of *cretaticostella*, but the description is so very brief and insufficient that without seeing his specimen I cannot be altogether certain that it is identical with that bred by me from larvæ feeding on Hickory leaves. His description, however, of *cretaticostella*, such as it is, is applicable to the Hickory-feeding species bred by me. I know three species feeding on Hickory leaves, but have only succeeded in rearing the imago from one, and as that one agrees in the characters of the case and larva with the case and larva mentioned by Clemens, I adopt the name suggested by him. His species *cretaticostella* was described in January, 1860, and his mention of the larva and case of *caryaefoliella* under that name was in 1861, so that the former name would be entitled to priority; but as there may be doubt whether the species are the same, and as the description of *cretaticostella* is so imperfect, and as, on account of the ease with which bred species may be identified, it is always desirable that the specific name should be derived from the food plant, I adopt *caryaefoliella* for this species.

C. rufoluteella Cham. is known only from captured specimens. I have always found it in abundance about the middle of July, resting upon palings in Linden Grove Cemetery, in Covington, Ky., a mile away from any Hickory trees. There it always makes its appearance suddenly and in considerable numbers, so that I have always supposed it to be a feeder on some species of plant found in the cemetery enclosure. I am, however, utterly unable to distinguish it from specimens bred by me in the latter part of June from larval cases found feeding on Hickory leaves in the manner described by Dr. Clemens for *caryaefoliella*, and I believe it to be the same species.

The species of this genus pass by such gentle gradations from those having the antennae densely clothed with scales, or the basal joint of it tufted or greatly enlarged, and with the second joint of the palpi distinctly tufted, to those in which both antennae and palpi are simple, that these characters afford little assistance in subdividing the genus. It is sometimes difficult to determine whether we should say "the basal joint of the antennae tufted," or only "enlarged," and so as to the palpi. Thus formerly (CAN. ENT., v. 6) I placed *rufoluteella* in the section "basal joint of antennae with a small tuft, palpi simple." But it now seems to me that

it would be more correct to say "basal joint of antennae somewhat enlarged; second joint of palpi with a very minute tuft."

The species is ochreous; the head and palpi pale or yellowish ochreous; the antennae white, annulate with brown; fore wings reddish ochreous, darker towards the apex, with the costal margin from base to ciliae white.

The larval case is ochreous red, cylindrical, laterally compressed at the hinder end, and over three lines long. It is attached to the under side of the leaves of *Carya alba*, and the larva eats out the parenchyma in little patches approaching a square form.

The ornamentation of the imago is nearer that of *C. limosipennella* than to any of the other species figured in *Nat. Hist. Tin.* *Al. ex.* 4½ lines.

C. Vernoniæella, n. sp.

This species, like many others which I do not specially name, is known only by its larval case, and I refer to it simply on account of its great size. It is about an inch long and slender, reminding one somewhat of the basal half of a "darning needle." The larva feeds on leaves of the Iron-weed (*Vernonia*). Miss Murtfeldt informs me that she has found it in Missouri, and I have found it in Kentucky.

There are two species besides *caryaefoliella* feeding on Hickory leaves. One of these makes a very small case, laterally compressed and but little more than a line long. Another makes a case about the size of that of *caryaefoliella*, but it is also somewhat laterally compressed, and the case having been cut out of the edge of the leaf, the upper edge of it shows the serrations of the leaf.

There is also a species making a pistol-formed case that feeds on Chestnut leaves. And the large blackish pistol-formed case of *C. tilliaella* Clem., the larva and case only of which are known, is also found here occasionally. I have also met with a small pearly-white case less than two lines long, and a white fusiform case one-half an inch long, besides many others found in this locality. A species which feeds on Blackberry leaves (*Rubus villosus*) makes a case out of the edge of the leaf, showing the serrations on the dorsal edge.

WINTERING VANESSA ANTIOPA.

BY C. G. SIEWERS, NEWPORT, KY.

This beautiful diurnal—the “Camberwell Beauty” of England, and very inappropriately styled the “Mourning Cloak” by Americans, for is it not clothed in a mantle of imperial purple, fringed with gold lace?—is well known to hibernate. It is occasionally found in stone piles in the winter, but I think its most common hiding-place is in the culvert walls of our country roads and turnpikes. It requires a cold, moist, dark place, or it will dry up.

Capturing a fine female on the 9th of October, 1876, I concluded to winter it. Placing it in a net cage with a dish of apple, sugar and water, I supposed my share of the performance over. It fed for several weeks, then fluttered a good deal and died the beginning of December. It had fairly dried up. This showed bad management. Last fall, on September 7th, passing a tree sugared the night before, I captured another female. This one I placed in a paper box eight inches square and high, removed the core of half an apple, sliced off a bit of the round side to steady it, placed it in a small two-inch dish, covered with sugar, and filled up with water. Once a week I renewed the water and sugar. It placed itself on the side of the box, directly over and within reach of the dish, and how ever I moved the apple I always found that it followed it around.

It evidently fed on warm days, but never opened its wings. I kept it in an up-stairs, cold room, where water would freeze, but still not as cold as out doors. It allowed me to handle it, and would lie flat on my hand without movement. In February I thought there were symptoms of weakening. It no longer perched on the side of the box, but remained on the bottom, leaning over very much to one side.

Placing it in sunshine the last week of February, it began to open its wings little by little, with short jerks, as if the tendons were loosening. When half open it was put away again. On the 11th of March, a warm cloudy day, I took it on my finger to an open window. While looking at its clear eyes the sun suddenly shone out, and the next moment it was gone. I had proposed to try and find a mate for it, but concluded to keep it till others were flying, and then take it to its old neighborhood and let it go. As it took the direction of its place of capture I was pretty sure

to see it again, and found it four days after in a sugar camp in the same woods. I recognized it at once by a bad bend in the tip of the wings, caused by a jam of the dish slipping on it.

On the 27th of March, two weeks later, the first *antiopa* appeared. I have so far failed to take the larva, but have just seen several imagines in a willow thicket, which gives me hope. They are usually rare, but some years their numbers make them a nuisance. Their color is dark purple with strong black spines. Food plants—Lombardy poplar and willow.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. ix., p. 156.)

[254.] V. HYMENOPTERA.

FAMILY MEGACHILIDÆ.

375. *MEGACHILE MARITIMA* *Stephens*.—Length of body 7 lines.

[271.] Body black, pubescent, thickly and minutely punctured. Mandibles very large, triangular, protended, not crossing each other, armed with four terminal teeth; face between the eyes thickly clothed with brown hairs, which grow tawny towards the mouth; antennæ filiform; back of the trunk clothed with brown hairs less thickly in the disk; wings a little embrowned, especially at the apex; nervures dusky; base-covers piceous; legs hairy with pale hairs; abdomen subovate with the three last segments fringed with pale hairs intermixed with black; the ventral hairs are tawny, paler towards the base, and darker towards the apex.

FAMILY ANTHOPHORIDÆ.

376. *ANTHOPHORA BOMBOIDES* *Kirby*.—Length of body 6 lines. A single specimen taken in Lat. 65°.

Body black, thickly punctured, clothed like that of a humble-bee with dense pallid hairs. Head triangular, upper lip subquadrangular, white with a black dot at each upper angle; nose white, naked; a bunch of whitish hairs conceals the base of the antennæ; antennæ filiform, scarcely longer than the head; vertex with some black hairs thinly scattered; occiput fringed with whitish ones; trunk subglobose, set with longish white hairs; hairs of the legs mostly black; tarsi piceous; the first or dilated joint is armed with a strong and sharp tooth on the inner side at the base; wings subhyaline with black nervures; abdomen between globose and triangular, with the three first dorsal segments clothed with long whitish hairs, and the tail and ventral segments with black.

[272.] FAMILY BOMBIDÆ.

377. *BOMBUS SYLVICOLA* Kirby.—Length of body 7 lines. A single specimen taken in Lat. 65°.

General hirsuties of the upper side of the body yellowish. Head with a tuft of the same colour below the antennæ, and another at the vertex; trunk with a broad black band between the wings; hairs of the thighs yellowish; those of the tibiæ black; tarsi more or less covered with short decumbent pale hairs; wings somewhat embrowned, with black nervures; abdomen with a broad, mesal, ferruginous band.

378. *BOMBUS BOREALIS* Kirby.—Length of body 8 lines. Several taken with the preceding.

[273.] Body clothed underneath with black, above with tawny, hairs. Face and vertex with a tuft of yellowish ones; thorax, between the wings, with a black hairy band; wings somewhat embrowned with black nervures; legs black; abdomen above with a thick coat of tawny hairs palest at the base; anus black.

379. *BOMBUS TERRICOLA* Kirby.—Plate vi., fig. 4.—Length of body 9 lines. Taken with the preceding.

♀. This species approaches very near to *B. terrestris*, but the whole upper surface of the abdomen is clothed with yellow hairs, with the exception of the first segment, the hair of which, and a band near the anus, are black; the extremity only of the latter is dirty-white; there are a few yellow hairs on the metathorax; and the wings are embrowned. In *B. ter-*

restris the abdomen is black, with a yellow band, and the two last anal segments are white; there are no yellow hairs on the metathorax, and the wings are much clearer.

380. *BOMBUS DERHAMELLUS Kirby*.—Length of body 8 lines. Taken with the preceding.

♀. Body hairy, black. Head with a tuft of yellowish hairs on the vertex; thorax yellow, black between the wings; wings more embrowned than in the male; abdomen yellow at the base with a black posterior band; anus ferruginous.

[274.] 381. *BOMBUS PRATICOLA Kirby*.—Length of body 7 lines. Taken with the preceding.

♀. Body black, clothed above with yellowish hairs. Head with a tuft of yellowish hairs below the antennæ, and on the vertex; thorax black between the wings, which are embrowned; legs with yellow hairs at the base; anterior half of the abdomen yellow, posterior ferruginous.

382. *BOMBUS VIRGINICUS Linn*.—Length of body $8\frac{1}{2}$ lines. Locality uncertain.

♀. Hairs of the body in general black, except a tuft on the vertex behind the antennæ, the anterior and posterior extremities, and sides of the thorax, and the first segment of the abdomen, which are clothed with yellowish hairs; between the wings the thorax is black; the tarsi are rufous; the wings are rather embrowned, most so at the apex; nervures black.

ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The Annual Meeting of the above Club will be held in St. Louis, Mo., on Tuesday, August 20th, the day preceding the meeting of the Association. It is hoped that all Entomologists who can possibly do so will be present on that occasion.

BOOK NOTICES.

Manual of the Apiary, by Prof. A. J. Cook, Lansing, Mich. Octavo pp. 286, with 110 illustrations; published by Thos. G. Newman & Son, Chicago.

We are indebted to our esteemed friend Cook for a copy of the second edition of this excellent work on Bee Culture, treating of the art in all its different branches in a clear, concise and interesting manner, showing throughout the author's thorough knowledge of the subject on which he writes. The work is divided into two parts, the first of which treats of the natural history of the Honey Bee, the second on the Apiary, its care and management. It is well got up and the illustrations are very good; we feel a pleasure in recommending it to all those interested in Bee Culture. The fact that the first edition of 3,000 copies issued less than two years ago is exhausted, shows that the public have appreciated the author's efforts.

Antigeny, or Sexual Dimorphism in Butterflies, by Samuel H. Scudder, 8vo., pp. 8, from the Proceedings of the American Academy of Arts and Sciences, vol. x.

The Insects of the Tertiary Beds at Quesnel, British Columbia, by Samuel H. Scudder, 8vo., pp. 15. From the Report of Progress, 1875-76, Geological Survey of Canada, containing descriptions of twenty species of fossil insects.

Additions to the Insect Fauna of the Tertiary Beds at Quesnel, British Columbia, by Samuel H. Scudder. From the Report of Progress, 1876-77, Geological Survey of Canada, 8vo., pp. 8, containing descriptions of six species of fossil insects.

Fossil Coleoptera from the Rocky Mountain Territories, by Samuel H. Scudder. Extracted from Bulletin of the Geological and Geographical Survey of the Territories, Vol. ii, No. 1, 8vo., pp. 10., in which are described 31 species of fossil Coleoptera.

Notice of the Butterflies collected by Dr. Edward Palmer in the arid regions of Southern Utah and Northern Arizona, during the summer of 1877, by Samuel H. Scudder. From the Bulletin of the Survey, Vol. iv, No. 1, 8vo., pp. 5, containing references to 41 species. We are very greatly indebted to the author for kindly sending us copies of the above valuable papers.

Field and Forest. This excellent monthly journal of Natural History continues to be well sustained. Among articles of especial interest to Entomologists we notice papers in the January and March numbers, by W. H. Edwards, of Coalburgh, W. Va., containing descriptions of nine new species of butterflies found in Colorado and Texas.

The Journal of the Cincinnati Society of Natural History ; 1ge., 8vo. pp. 52, with two plates. Terms, \$2 per vol. ; single numbers, 60 cts. The first number of this new quarterly journal of Natural History is at hand. Besides matters of local interest connected with the Society, the present number contains a paper "On the Tongue of some Hymenoptera," by V. T. Chambers ; a catalogue of the Lepidoptera observed in the vicinity of Cincinnati, by Charles Drury, including 475 species ; Contributions to Palæontology, by S. A. Miller and C. B. Dyer, and a description of *Pupa Cincinnatiensis*, by C. R. Judge.

Bulletin of the Buffalo Society of Natural Sciences. Part 5 of Vol. 3, the closing number of the volume, is at hand, containing papers by Henry R. Howland, on Recent Archaeological Discoveries, illustrated by three photographic plates ; D. S. Kellicott, description of a new species of *Argulus*, and a new Check List of North American Sphingidæ, by Aug. R. Grote.

CORRESPONDENCE.

PAPILIO THOAS.

It may be of some interest to the readers of the CANADIAN ENTOMOLOGIST to know that one specimen of *Papilio thoas* was captured in Hamilton last summer, in the south-eastern part of the city, and one specimen on the G. W. R. track near Dundas. Both specimens were badly broken. Mr. D. Little has the one here, and Mr. R. Kyle, of Dundas, has the other.

WILLIAM MURRAY, Hamilton, Ont.

We captured at Center, N. Y., April 24th, *Smerinthus cerisii* in excellent condition. So far as I am aware, it has never been taken in this region before. You see Center still holds her own, and every season yields up new treasures.

JAMES S. BAILEY, Albany, N. Y.

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